CLAIMS

1. A nozzle assembly for a high velocity oxygen fuel (HVOF) thermal metallic spray coating apparatus, said nozzle assembly comprising:

an inner tube extending longitudinally along an axis and defining a feed passage for a feed wire of metallic spray coating material;

an outer tube disposed concentrically about said inner tube; and

an intermediate tube disposed concentrically between and spaced radially from said inner and outer tubes to define a pair of concentric annular longitudinally extending gas flow passages for oxygen and gaseous fuel.

2. The nozzle assembly of claim 1 wherein one of said gas flow passages is coupled to a source of oxygen and the other of said gas flow passages is coupled to a source of gaseous fuel.

3. The nozzle assembly of claim 1 wherein said inner tube mounts a longitudinally slotted nib at a discharge end of the nozzle assembly and said outer tube mounts a plug engaging said nib to define an array of circumferentially spaced longitudinally extending slots at said discharge end of said nozzle.

4. The nozzle assembly of claim 3 wherein said intermediate tube extends over a portion of said slots and defines the start of a premix zone downstream of said intermediate tube where the oxygen and fuel streams come together and partially mix within the slots between said nib and said plug before exiting slots into the combustion chamber where complete mixing occurs.

5. The nozzle assembly of claim 1 wherein said nozzle includes a discharge end and an air cap coupled to said discharge end having a radially directed outlet.

6. The nozzle assembly of claim 1 wherein said tubes are rotatable about said axis.

7. A nozzle assembly for a high velocity oxygen fuel (HVOF) thermal metallic spray coating apparatus, comprising:

a set of tubes for delivering combustible oxygen, fuel gases and a feed wire to a combustion zone of said apparatus, said set of tubes including an outer tube having an outer cylindrical surface adjacent said combustion zone;

an air cap fitted to said outer tube having an inner wall surface defining said combustion zone when the feed material is melted by reaction of the combustion gases and expelled at high velocity from said air cap through a discharge opening therein; and

wherein a portion of said air cap extends over said outer tube in radially outwardly spaced relation thereto to define an annular cylindrical air gap between said inner surface of said air cap and said cylindrical outer surface of said outer tube, said air gap coupled to a source of high velocity air for developing a column of air within said air gap which travels along said air cap toward said discharge opening and provides a boundary of air flowing along said inner surface of said air cap to protect said inner surface from exposure to the heat of the combustion chamber flame and molten metal feed wire material.

8. The apparatus of claim 7 including a porous bushing disposed between said air cap and said inner tube to maintain concentricity and permit rotation.